Understanding African Peri-Urbanization Using Participatory GIS

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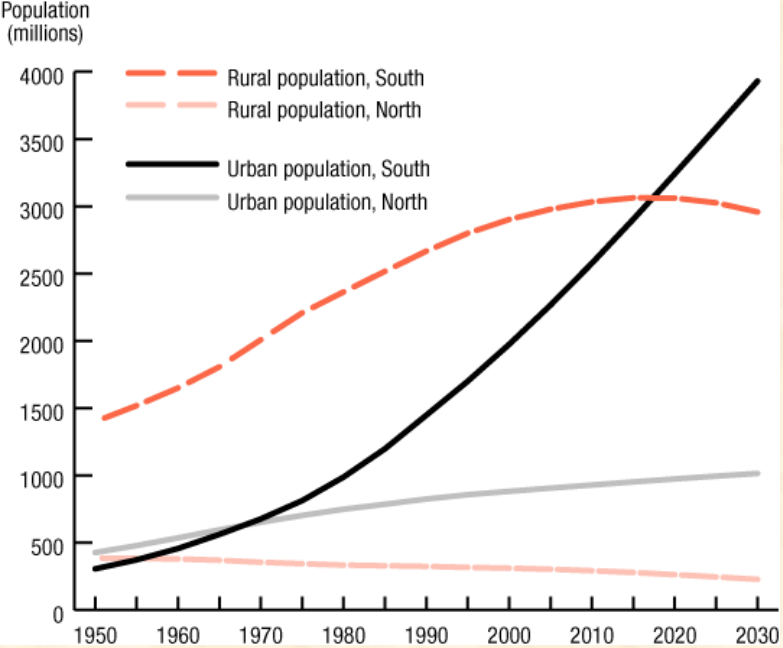
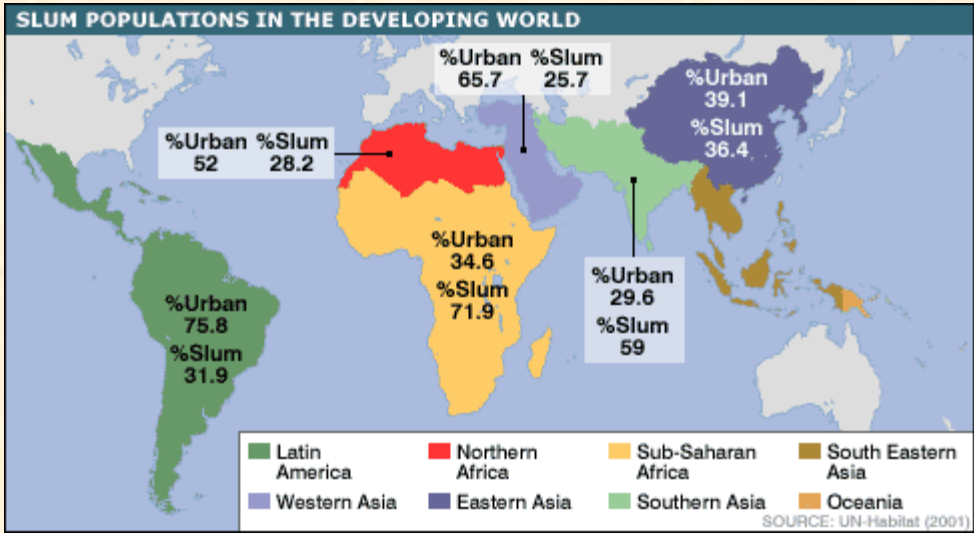


- One in two people will live in cities in 2008
- Growth largely in developing countries
- Current growth-peri-urban phenomena
- Problems of cities are problems of peri-urban areas
- Too many people, too quickly
- A nocturnal population
- New set of problems resulting from Rapid transformation of space



Introduction

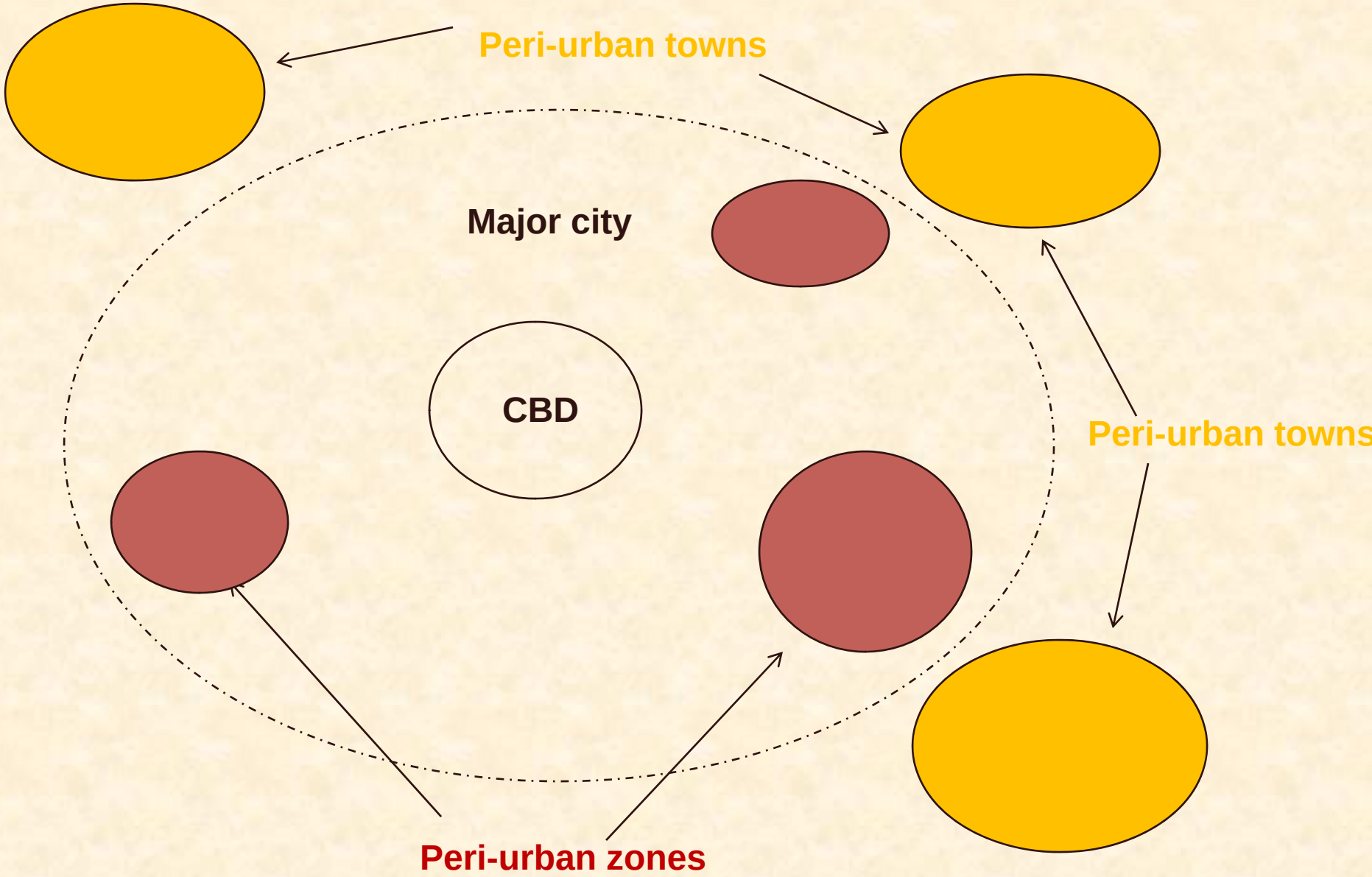
- GIS practice for African urban research and planning – increasing rapidly
- Current systems – reside within mainstream planning and research
  - Larger cities and municipalities – running fully fledged GIS units - aid in decision-making
  - Emphasis on visual aspect of the urban built environment
- Applications limited in lower levels of local government – Why? Situation worse in peri-urban towns – Why?...
- Few cases: Commissioned studies and donor funded projects
  - Experiential data - often peripheral in these conventional databases
- Result: Unsustainable use of GIS; Limited understanding

In this study, we:

- 1. Examine some new challenges facing African peri-urban areas and further explore the potential for geospatial technologies to address these challenges?
- 2. Identify some potential limitations of geospatial information technologies in certain social contexts, (peri-urban) Africa in particular.
- Examine how participatory GIS approaches may contribute to a better understanding of African peri-urban landscapes residential

What are peri-urban areas and what makes them unique?

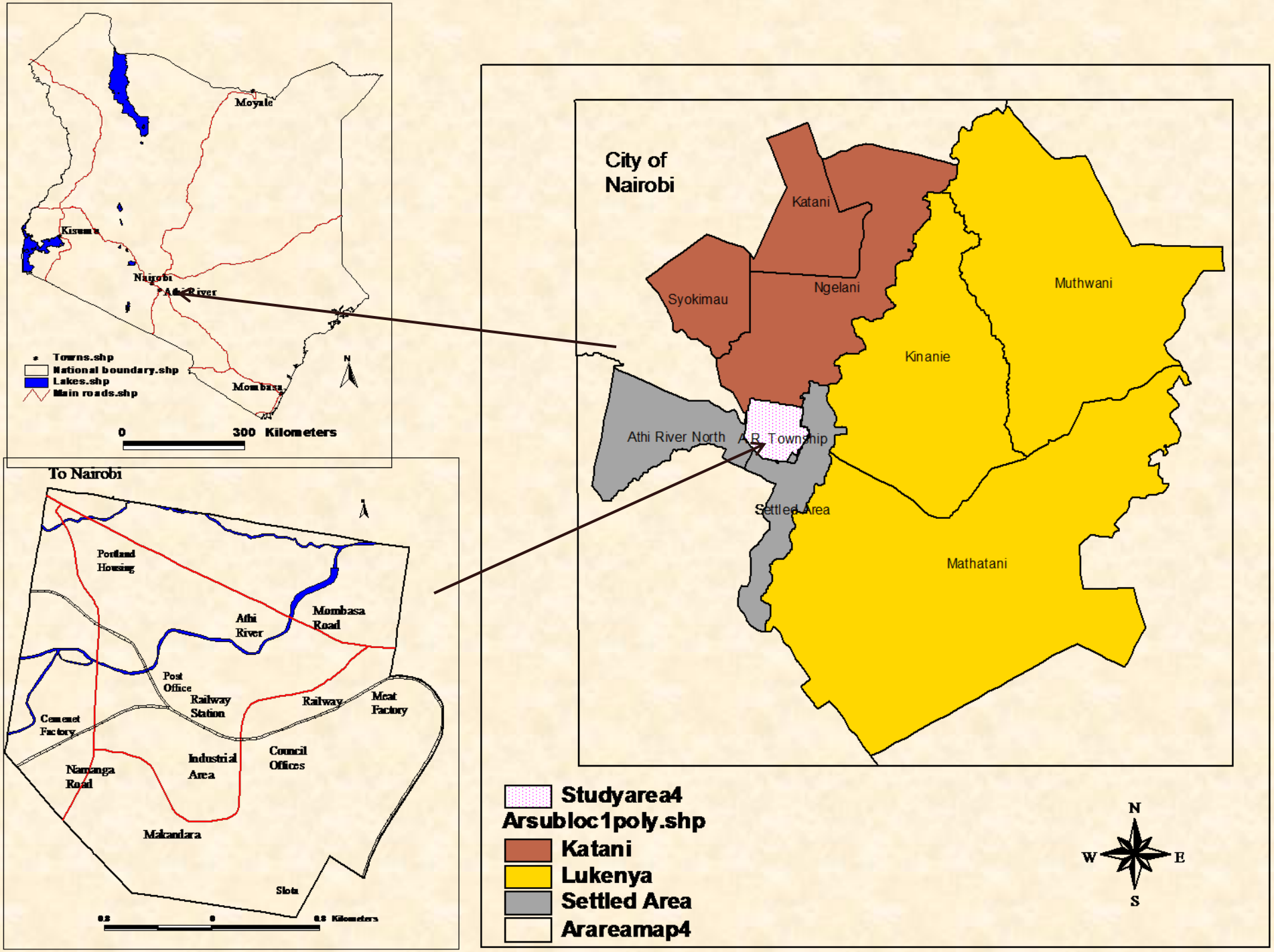
- Definition has evolved spatially – and so is terminology
- Generally – settlements on the fringe (periphery)
- What is the space economy like?


Peri-urban towns
Major city
CBD
Peri-urban towns
Peri-urban zones

Space economy – highly diverse;
Socially and spatially differentiated

Categories of Residential neighborhoods – Socially and spatially differentiated

What is the price of “too many people, too quickly?


Moyale
Kisumu
Nairobi
Athi River
Towns.shp
National boundary.shp
Lakes.shp
Main roads.shp
N
Mombasa
0
300 Kilometers
To Nairobi
Portland Housing
Athi River
Mombasa Road
Post Office
Railway Station
Railway
Meat Factory
Cement Factory
Industrial Area
Council Offices
Namanga Road
Makandara
Slota
0.2
0
0.2 Kilometers
City of Nairobi
Katani
Syokimau
Ngelani
Muthwani
Kinanie
Athi River North
A.R. Township
Settled Area
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Katani
Lukenya
Settled Area
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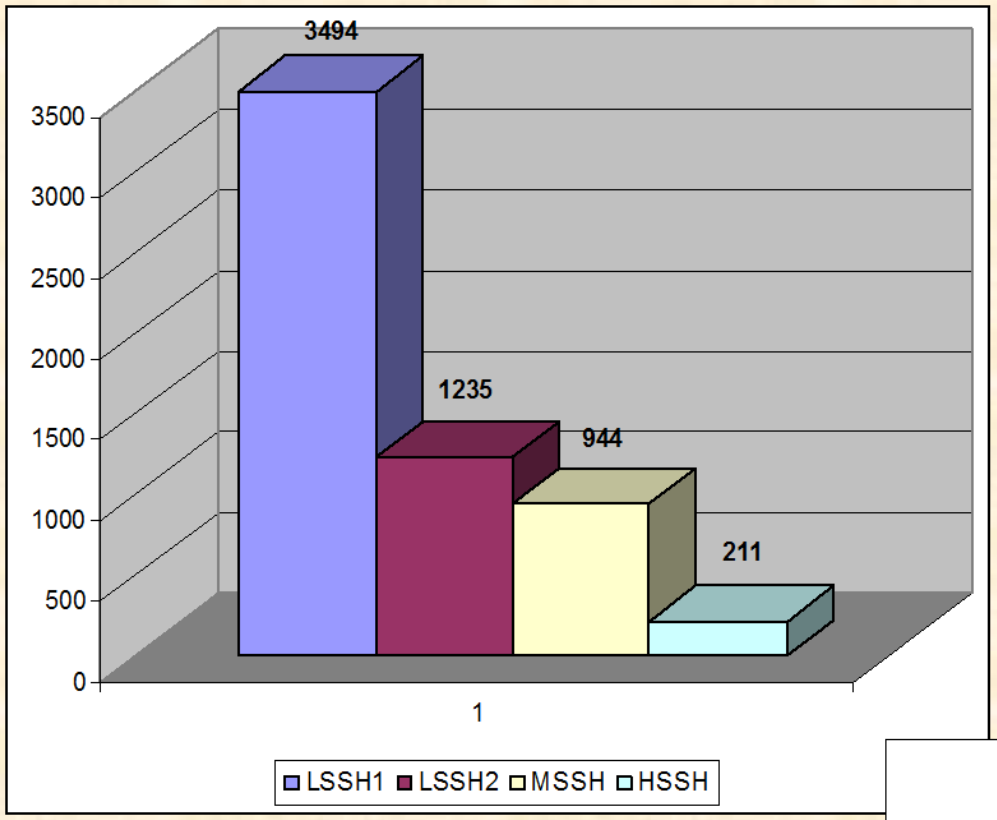
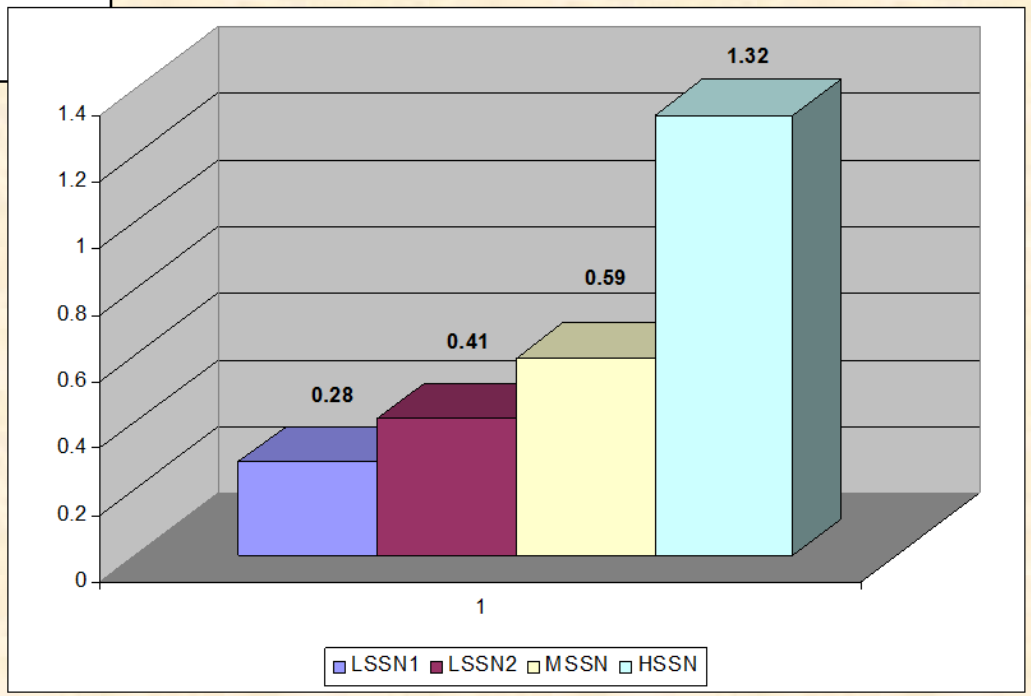
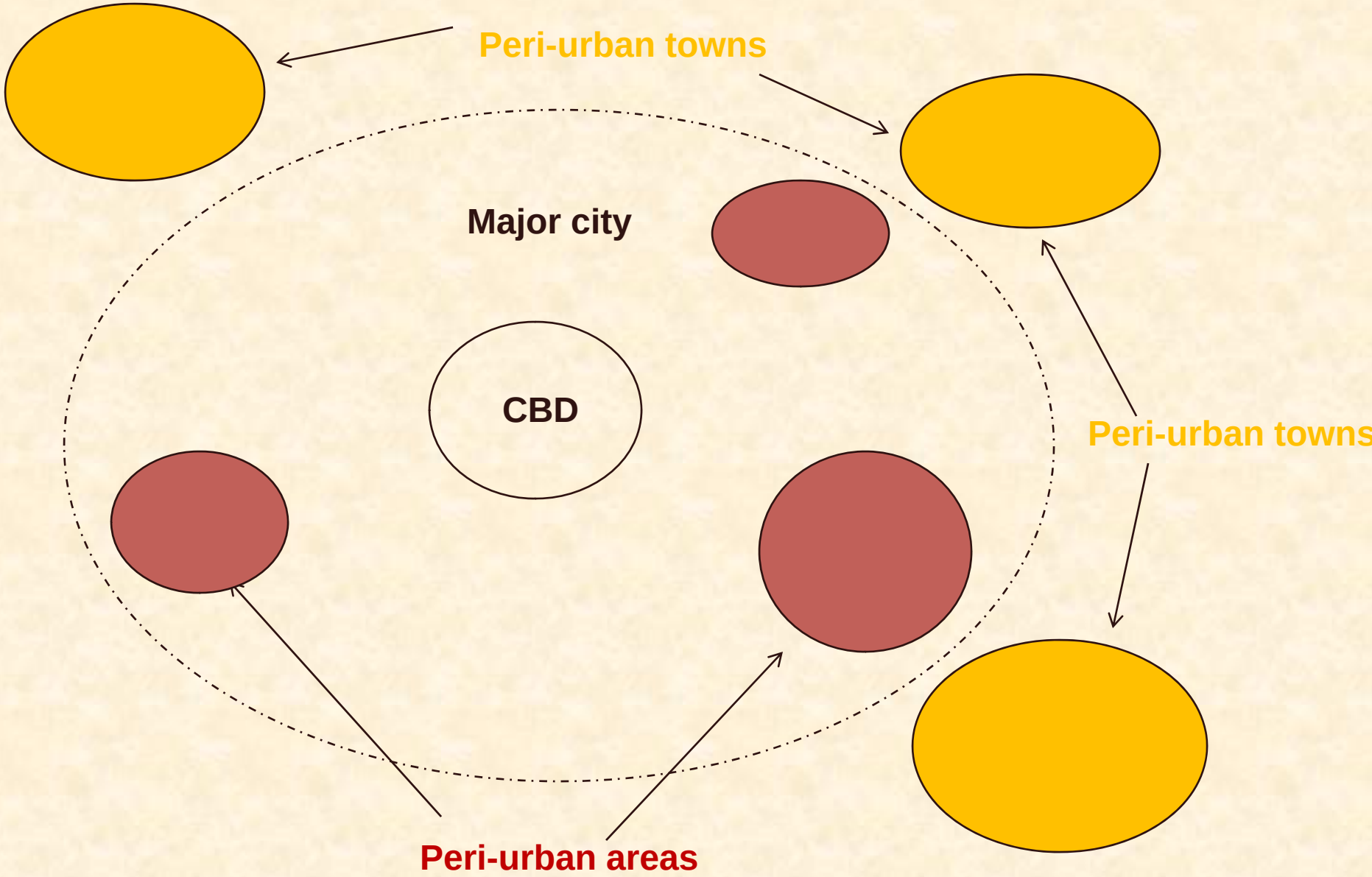


Land use issues:
Residential housing categories (left)
Vs. total area occupied (below)



Conceptual and Theoretical Framework

- 3 perspectives can be identified
- **1. Organic growth** – Baker, 2002; World Bank, 2000
- **2. Transitional space standpoint** - Bohland and Browder, 1995; Baker, 1995; Briggs and Mwamfupe, 1999; Freidberg, 2001; Gough and Yankson, 2000; Mulenga, 1995
- **3. Satellite town perspective** – Kiamba, 1994; Rambanapasi, 1994


Peri-urban towns
Major city
CBD
Peri-urban towns
Peri-urban areas

•What kinds of names have been used to refer to peri-urban areas?

•Zones of spatial contact, agglomerations of poverty, metropolitan villages, belts of misery, and slums of despair (Browder and Bohland, 1995);

•African urban garden belts (Friedberg, 2001);

•Expanded agricultural areas (Briggs and Mwamfupe, 1999; Freeman,1991);

•Spontaneous settlements, squatter settlements (Memon, 1982);

•Dormitory towns (Rambanapasi, 1994) and

•Sinks for the city waste (Birley and Lock, 1998).

Planners
Urban sociologists
Development practitioners
Public health professionals
Policy analysts
And Geographers!

“The social life of peri-urban locations has remained peripheral in most of these contemporary discourses. What you find is analysis of patterns of change, mainly resulting from encroachment from an adjacent city… as reflected in the terminology, the field of research has been conceptualized in terms of what these areas presumably not…and have assumed that their work is to introduce dynamics by which to bring such areas more closely into line with conventional urban development…Very few have undertaken the fine-grained historical and analytical work that is required to understand the social, economic and political processes by which such communities have evolved and operate”

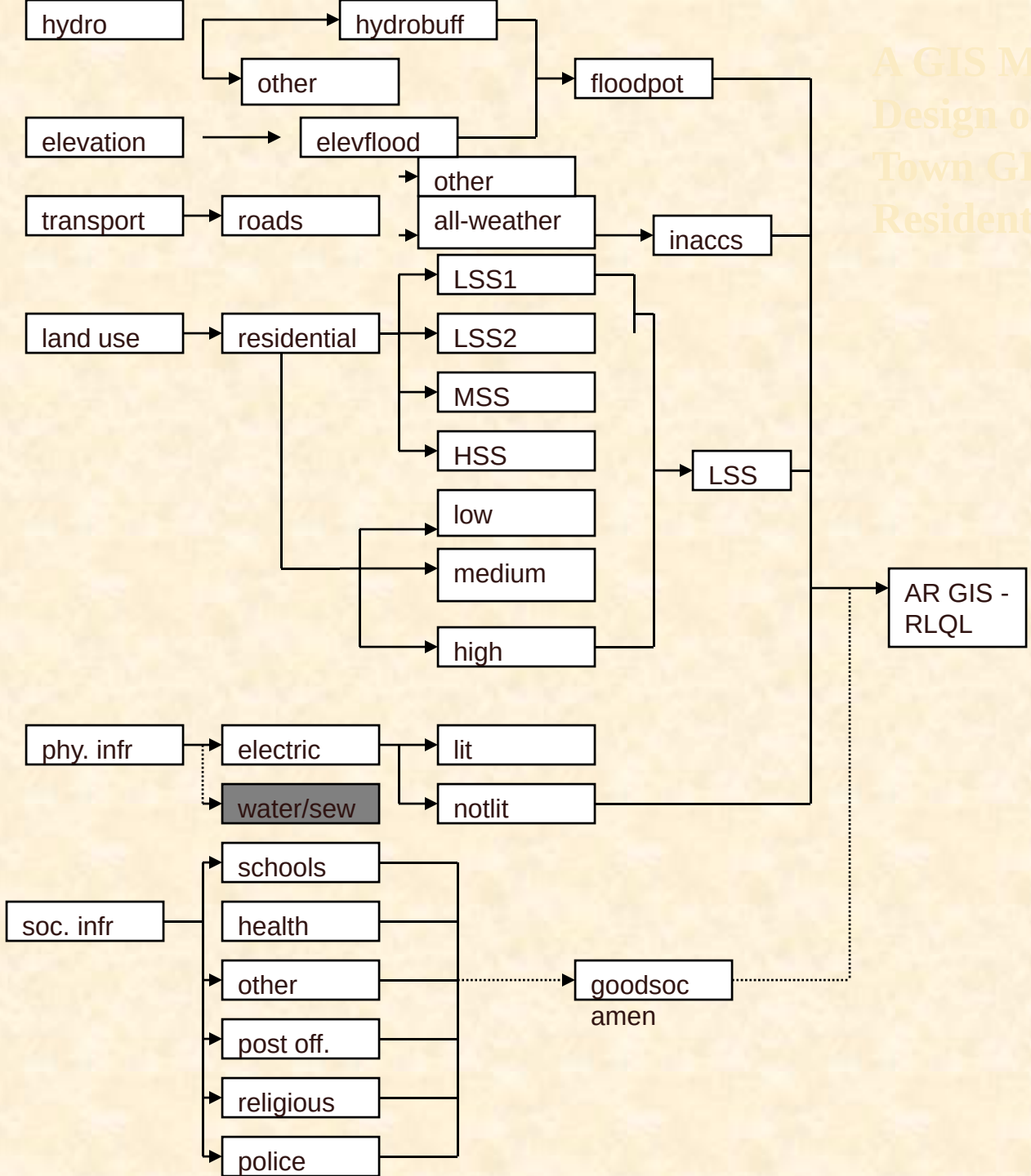
Baker, 2002

Data and Methods

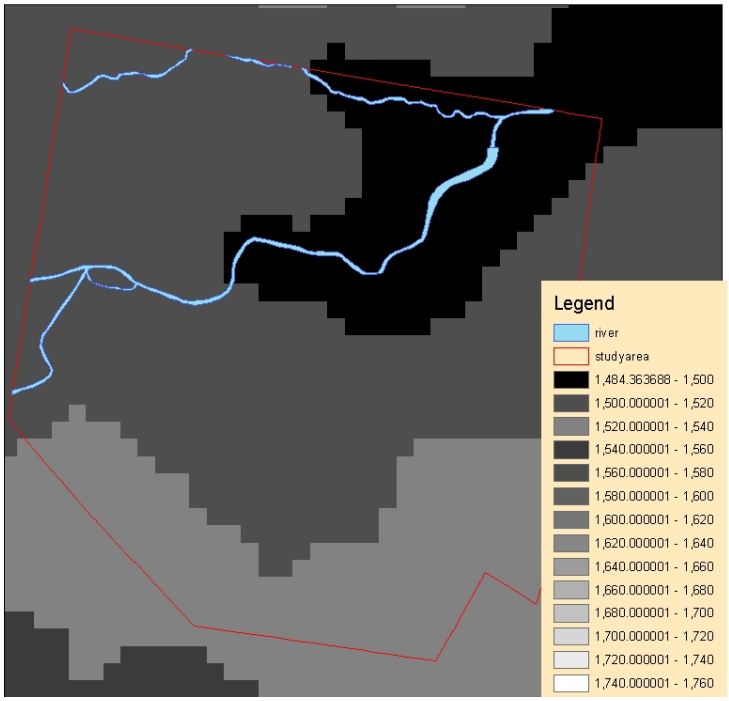
- GIS Analysis
  - Dataset: Hydro data; Elevation, transportation, land use, physical infrastructure and social infrastructure
- GPS transect walks
- Focus group discussions
- Mental mapping workshops
- Interviews

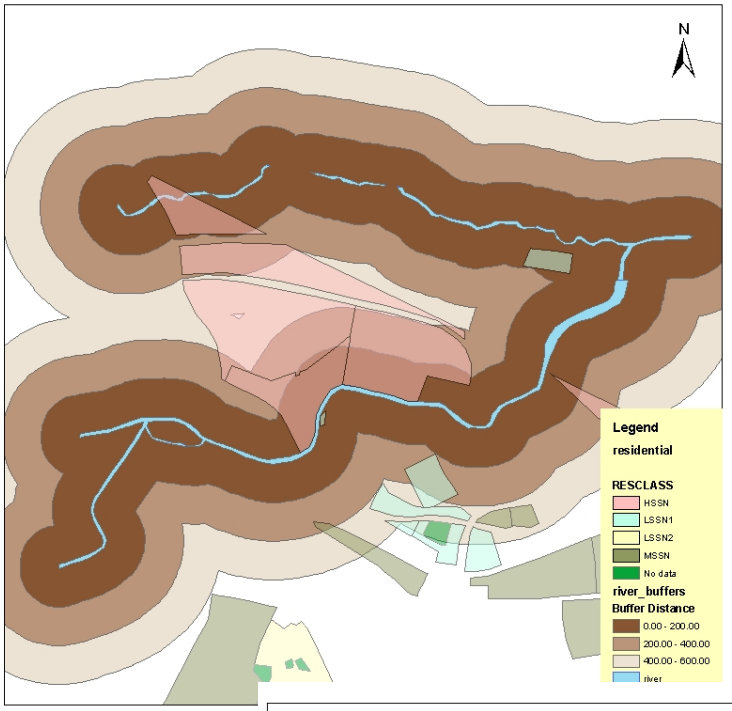
Assessing quality of life using Geospatial technologies – the conventional approach

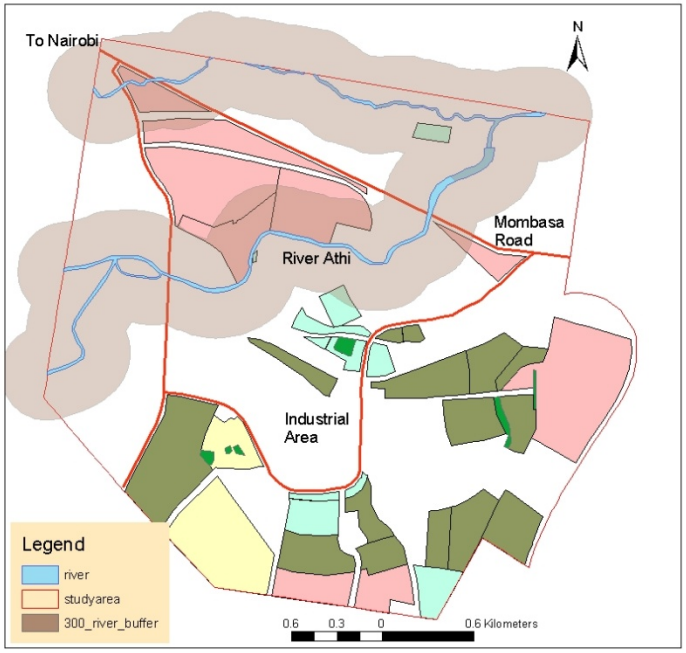
- Typically measurement and quantification
  - Housing quality – size type, etc
  - Environmental vulnerability - Flood-prone areas
  - Accessibility by road
  - Availability of and access to physical infrastructure
  - Social infrastructure
  - Service Provision



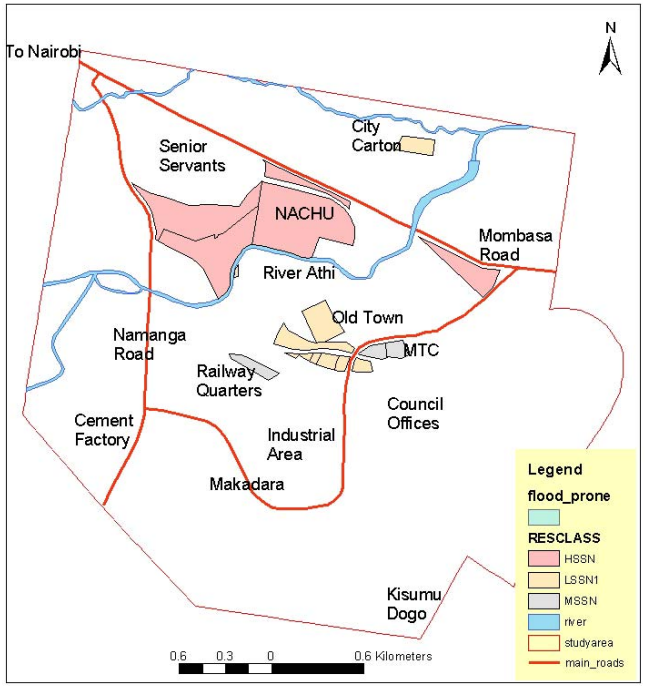
A GIS Model for the Design of an Athi River Town GIS for Uneven Residential Development

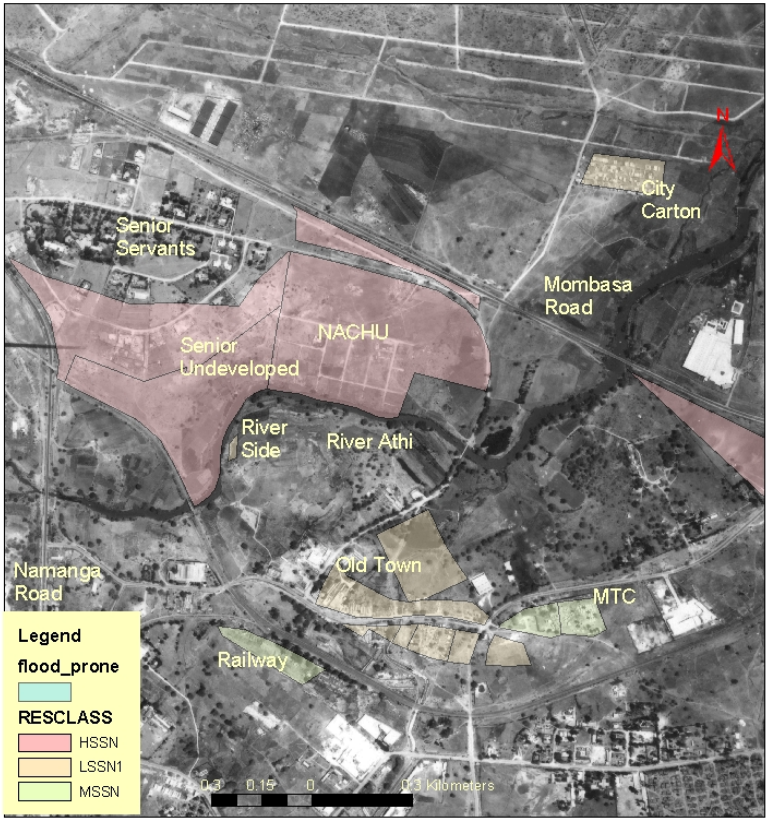






Mapping flood Potential areas

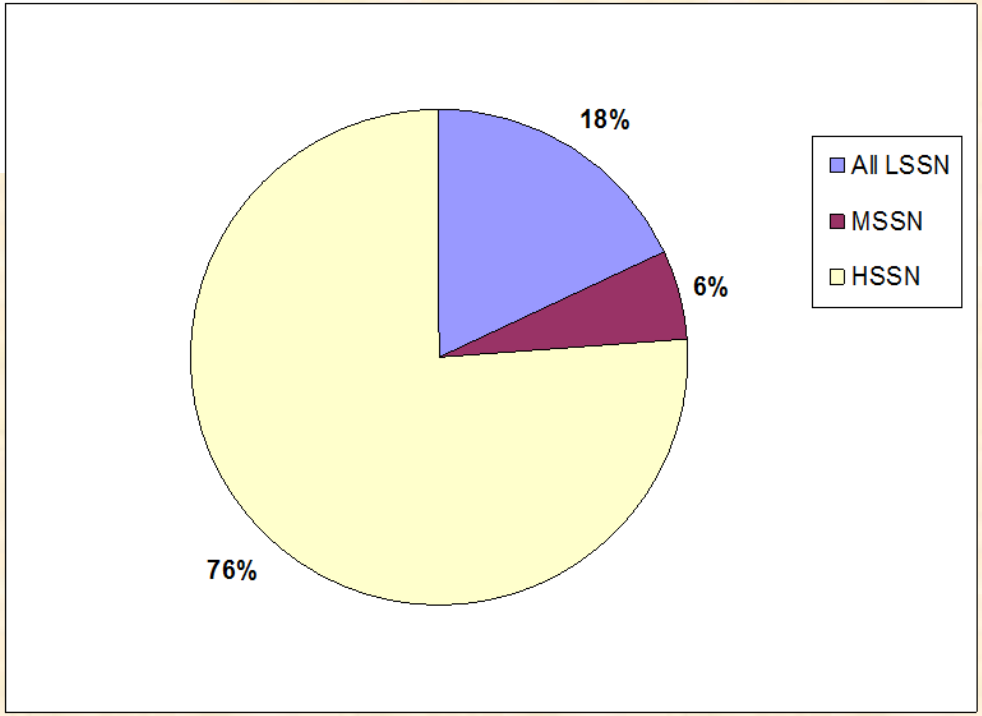




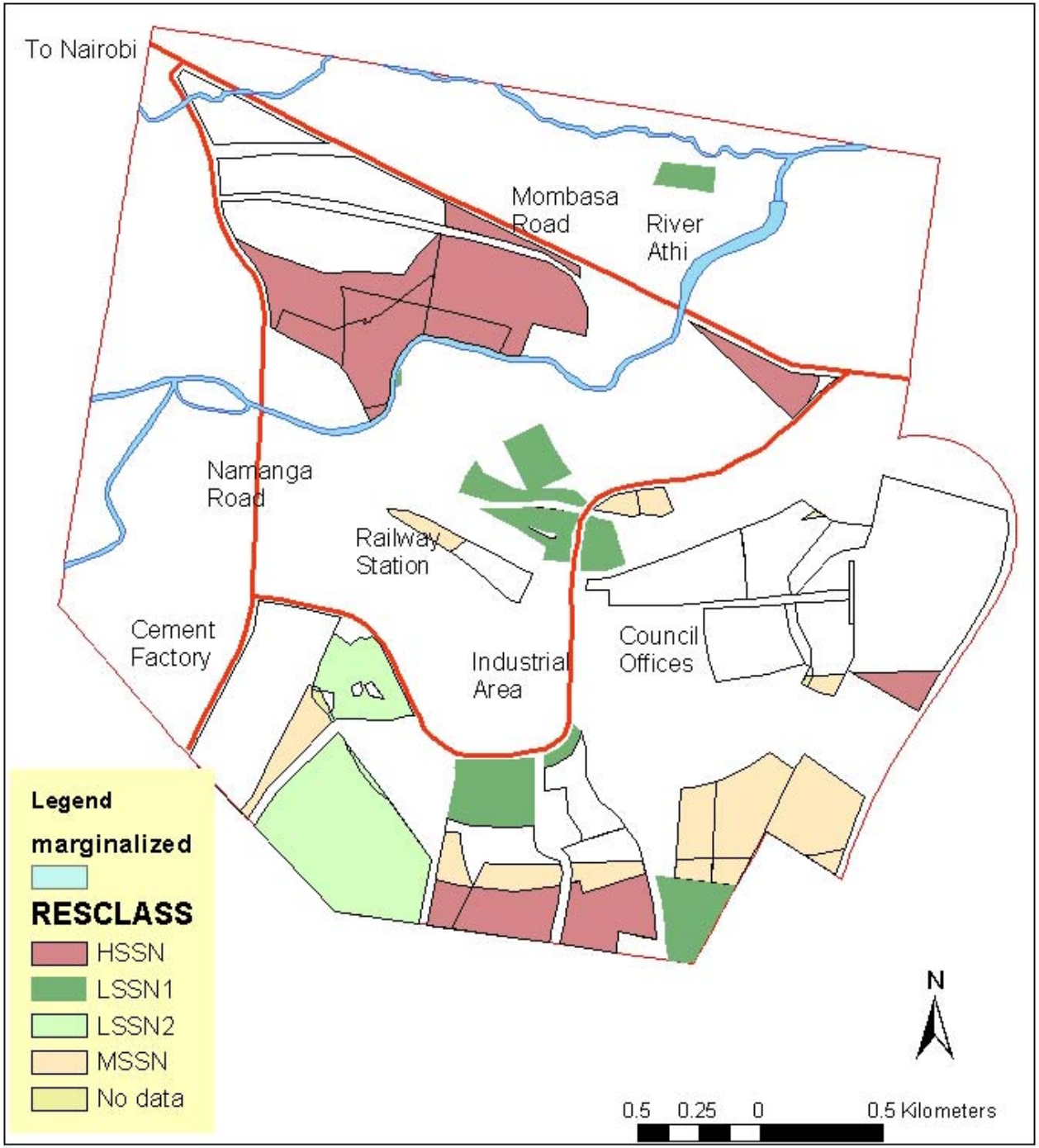
76% of flood potential areas (FPAs) In HSSNs?

Same is repeated for:

- **Accessibility by roads**
- **Access to power**
- **Social infrastructure, etc**



Finally: Socially and spatially Differentiated residential Areas derived from a GIS-Based analysis



Are there some limitations within expert-based approaches to understanding peri-urban landscapes?

- Limitations
  - GIS and homogenization of residential space
  - Social and political context of uneven development
  - GIS and social meanings
  - How do you put unofficial information into context
  - Confronting political and social realities in certain cultural contexts
- What are the **real issues** that concern local communities?

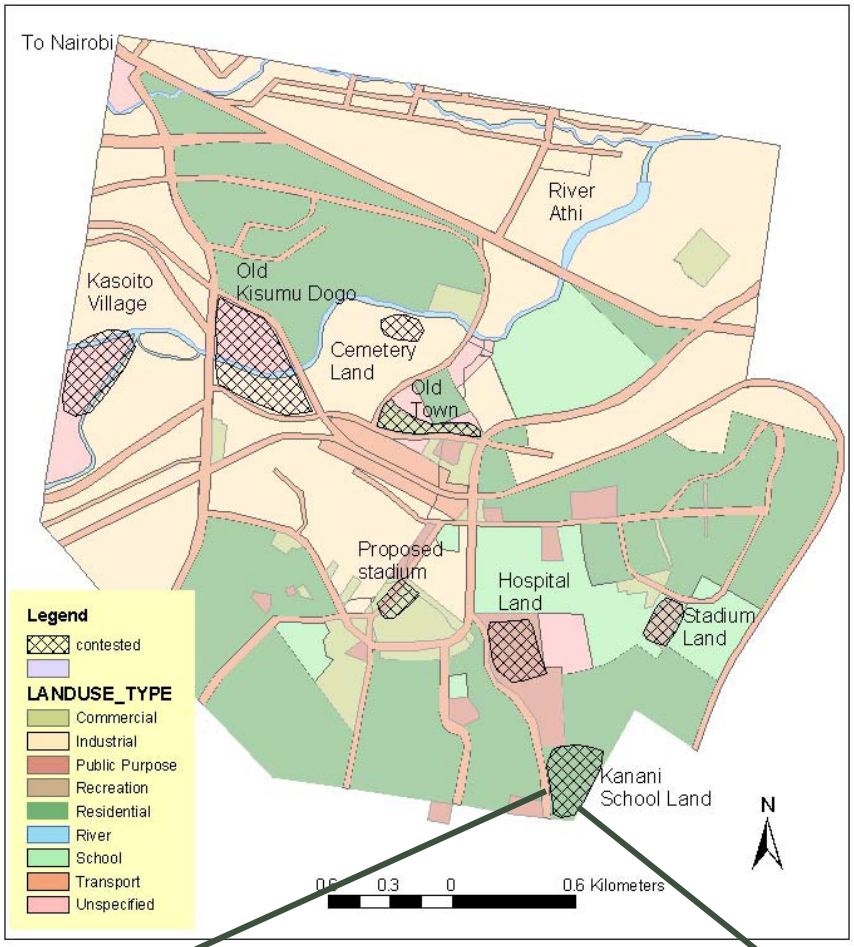
What can alternative sources tell us that GIS won't in a data poor environment?
Sewer availability vs Connectivity?

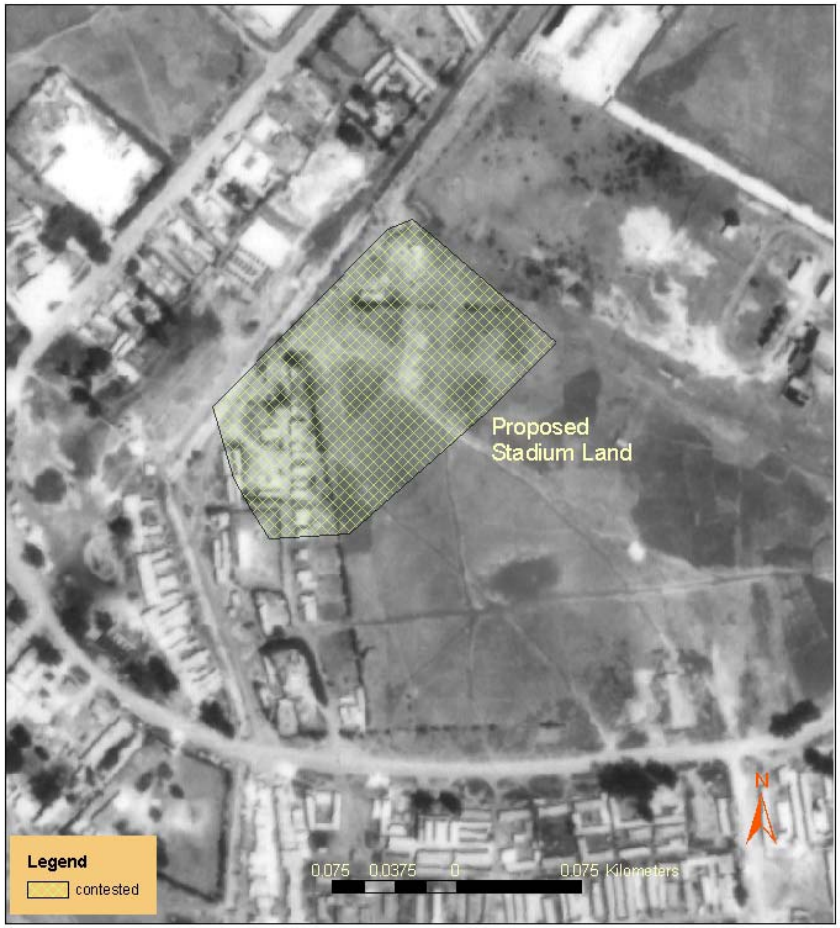
Issues of Local Community Concern in Athi River Town

- Water
- Sewer
- Roads
- Solid waste
- Pollution
- Land issues
- Schools

“The biggest problem here in Kisumu Dogo is water. You can have a good house with a toilet, but you cannot use it because we have no water. Look at those people waiting for water…. You can wait here for water sometimes for more than two hours. Do you say there is something else our development should talk about in this town except water?”

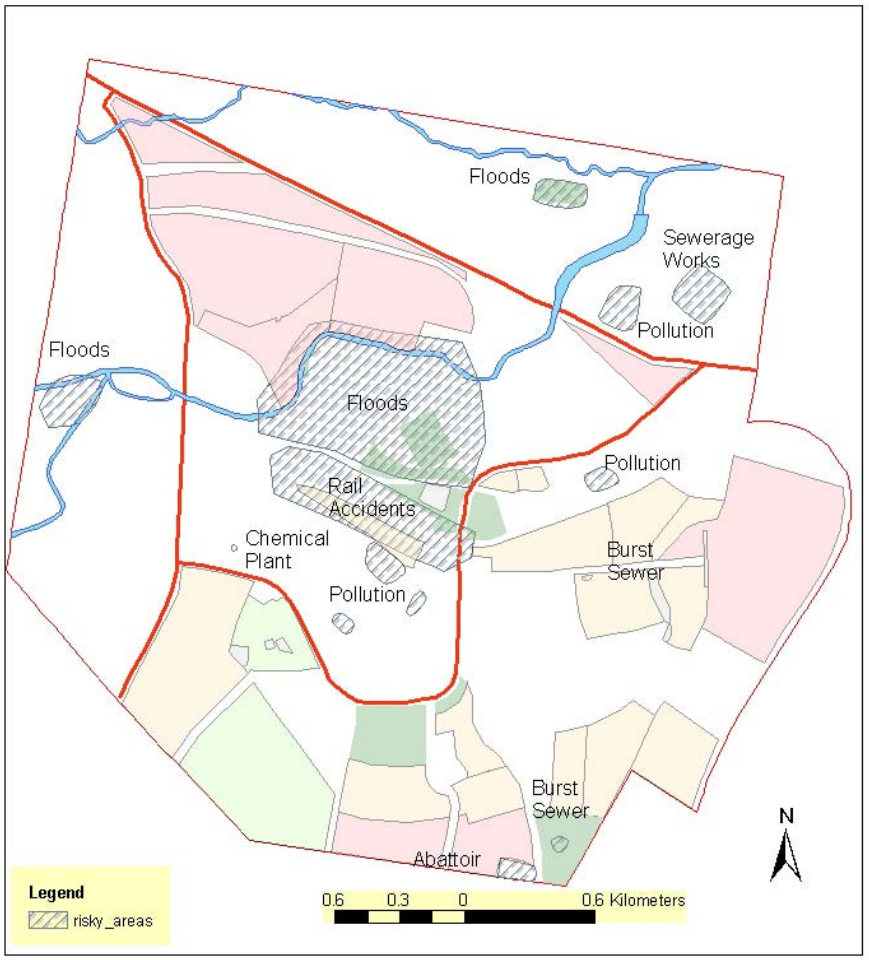
Mental maps of
Contested spaces
Overlain town
Land use map

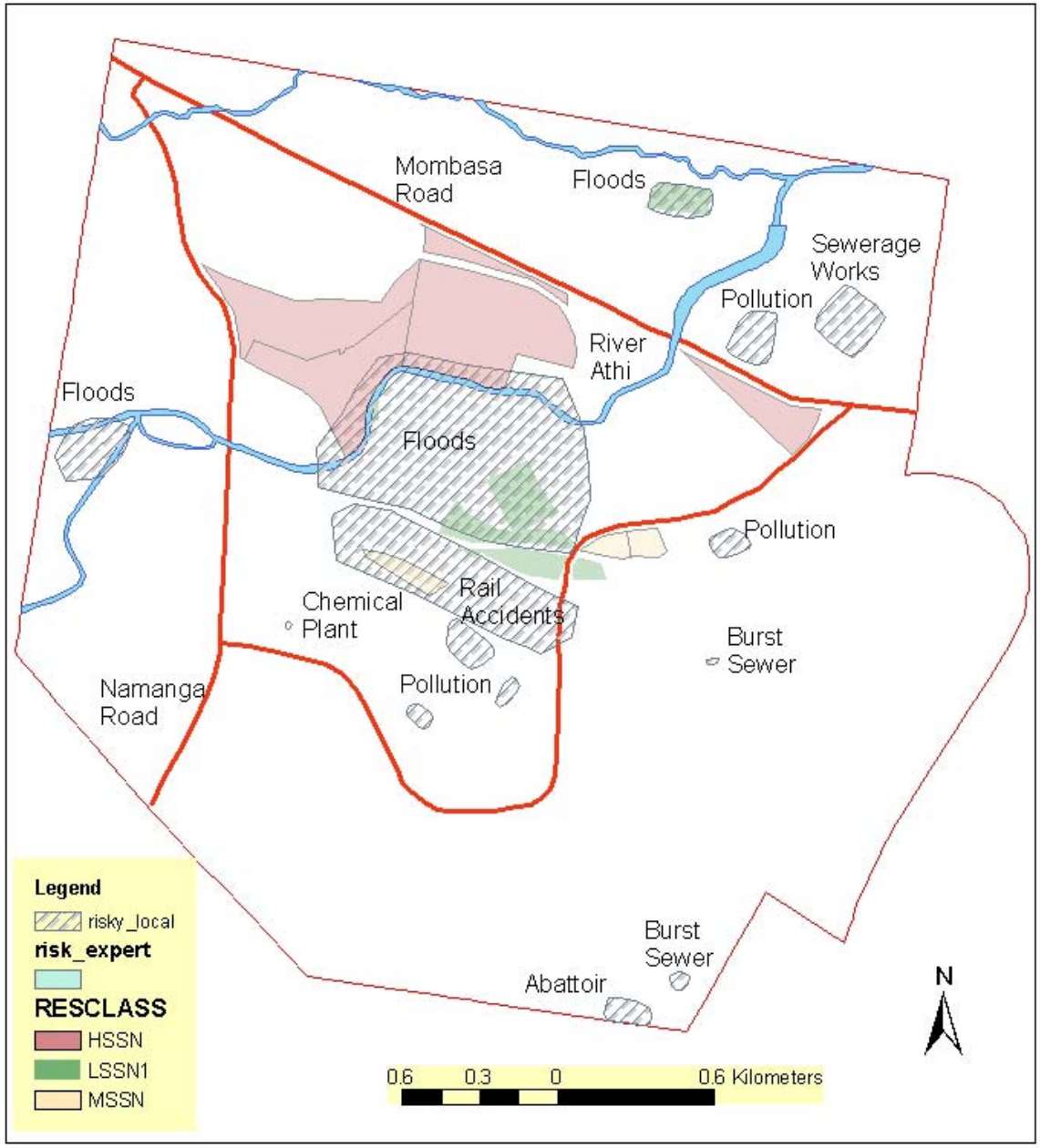




Loss of cultural areas in Athi River town

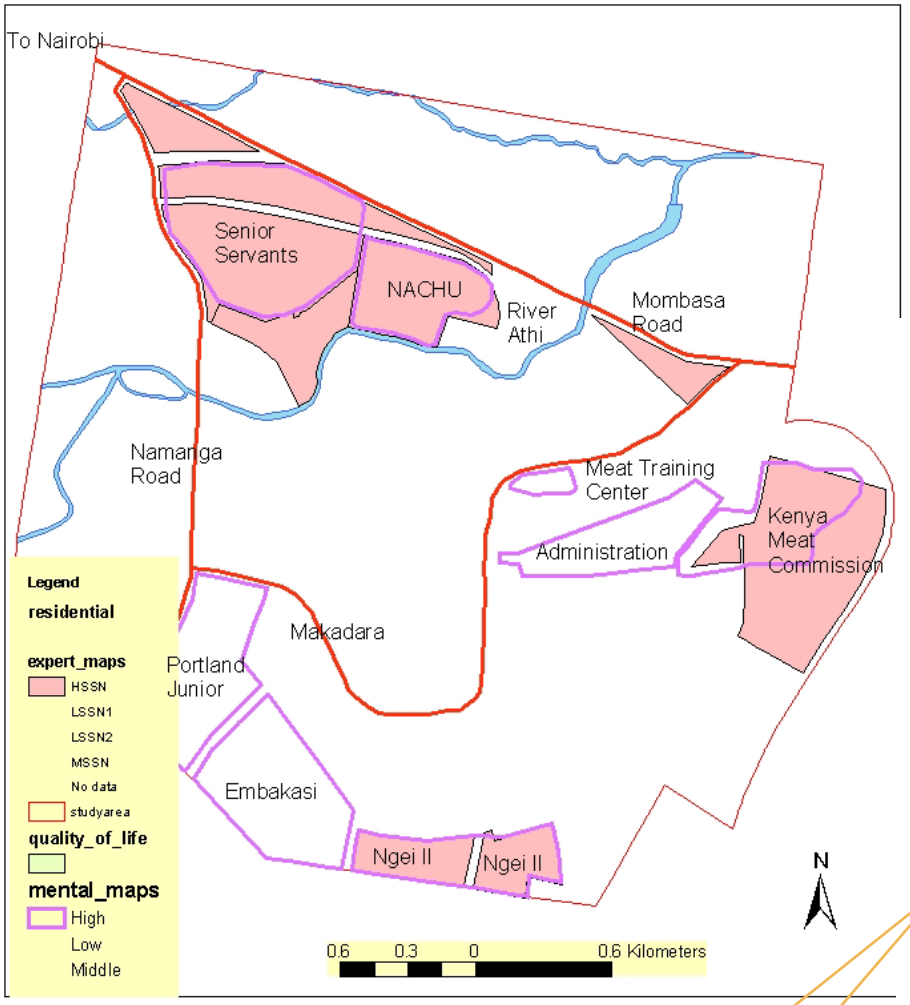
What is the local community perception of risk?

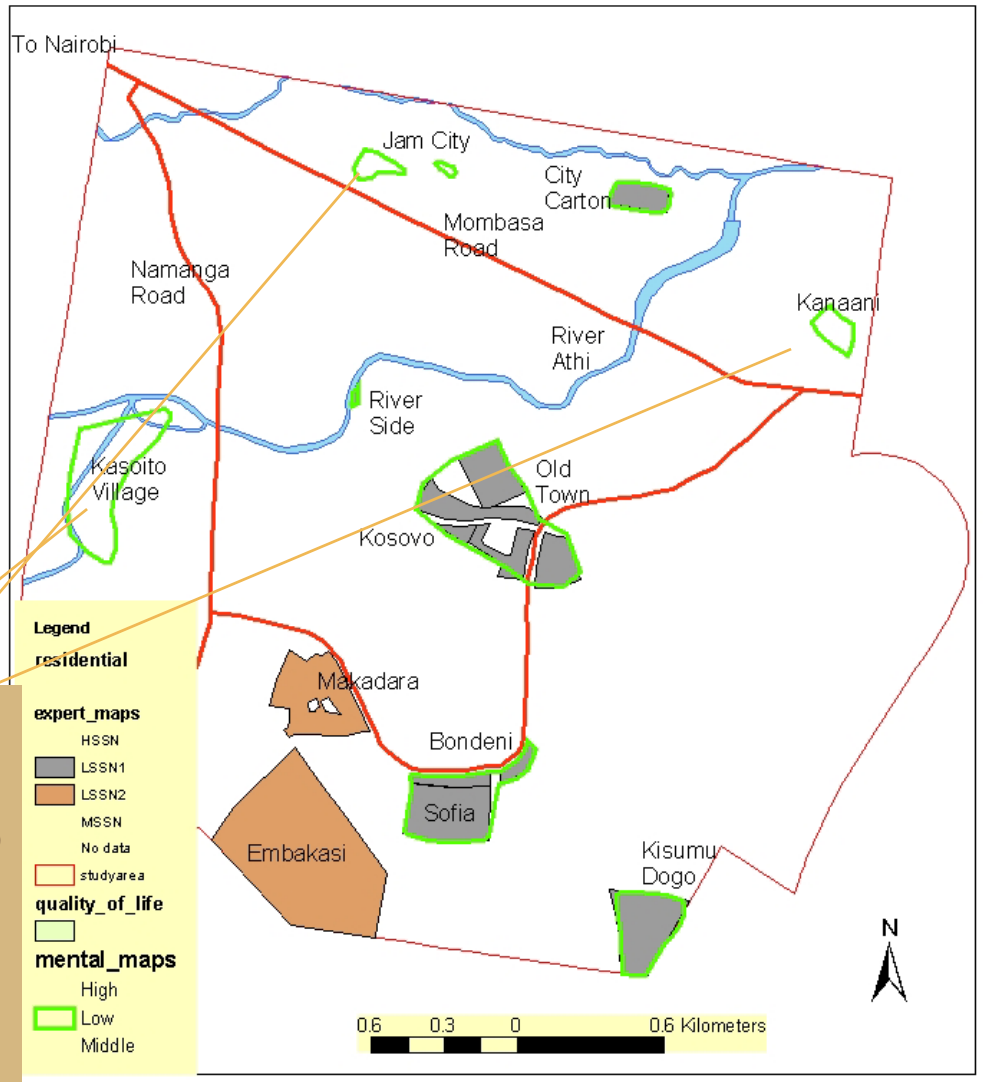




Local community perceptions of Exposure to risk overlain the GIS /expert map: Complimentary or contradictory?

Local community mental maps of quality of Life contrasted with GIS-derived maps: HSSN (left) and LSSN (below)





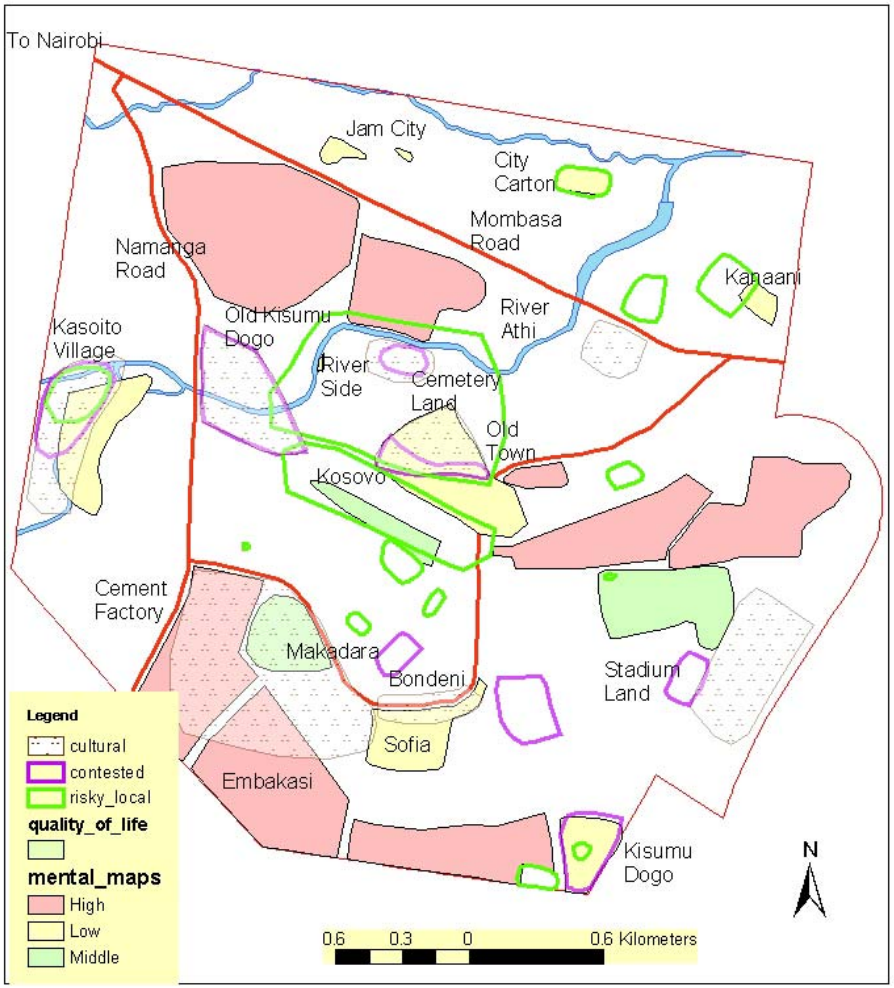
"They came here the other day... What do they know…they wont put us on their maps, they even call us illegal, … we have lived here long before this was a town, if we are illegal, then no body is legal in this town"

Resident – Kisumu Dogo Village

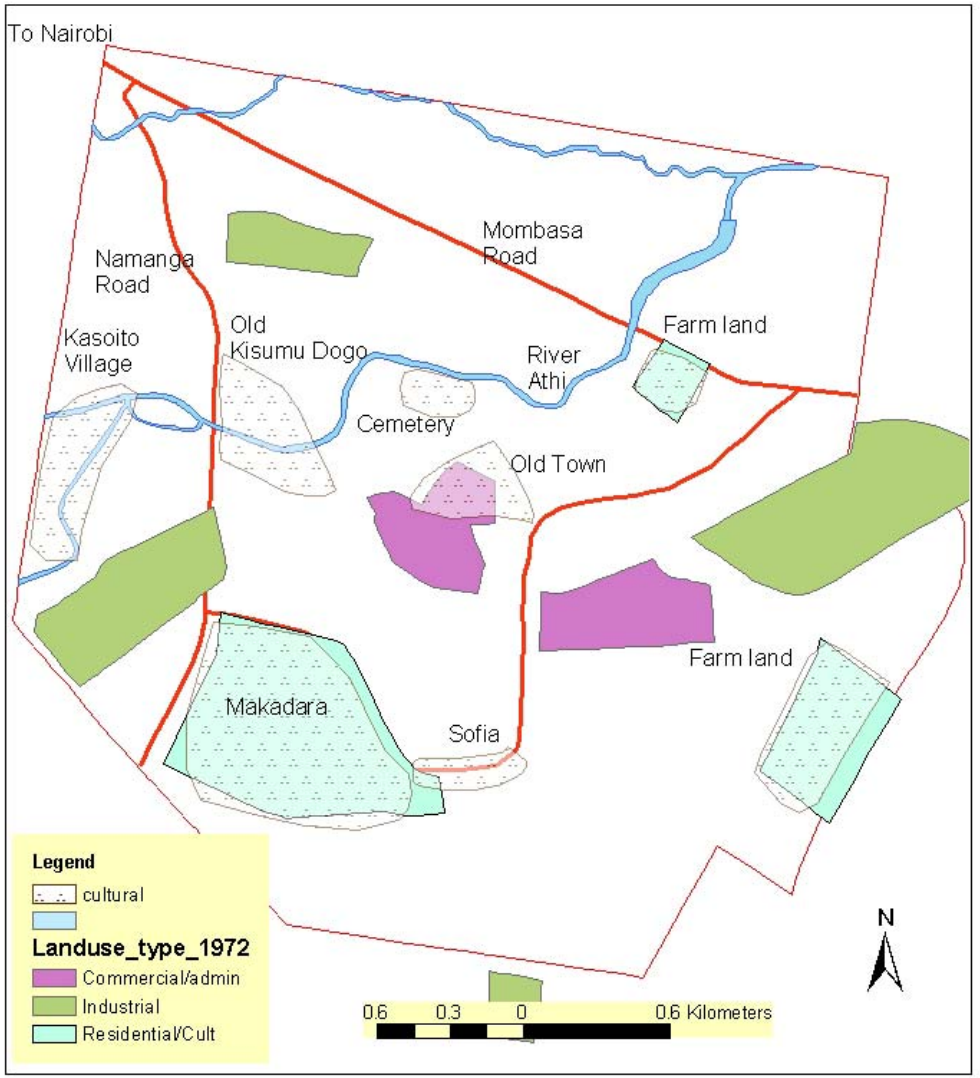
I have lived here with my wife and 5 children since the late 1950s until they were adults and left. I have never had 'running' water or sewer in my house. I do not know what electricity in my own house would look like. They have promised us things until we are tired of listening to them. I have gone to council meetings until I have no interest to go anymore because nothing gets implemented. I think 'upper people' matter here, not us. If we mattered to anyone for the past 40 years, Sofia area would have at least running water by now. Tell me I am in anybody's development planning book for those 40 years, and I will tell you, you don't know what you are talking about

Resident of Sofia

Mental map overlay of quality of life compared with historically residential and cultural areas, contested lands and environmentally vulnerable areas (left)



An overlay of a 1972 land use map of Athi River reproduced from Laurenti and Gerhardt (1972) and local community mental maps of historically cultural areas (right)



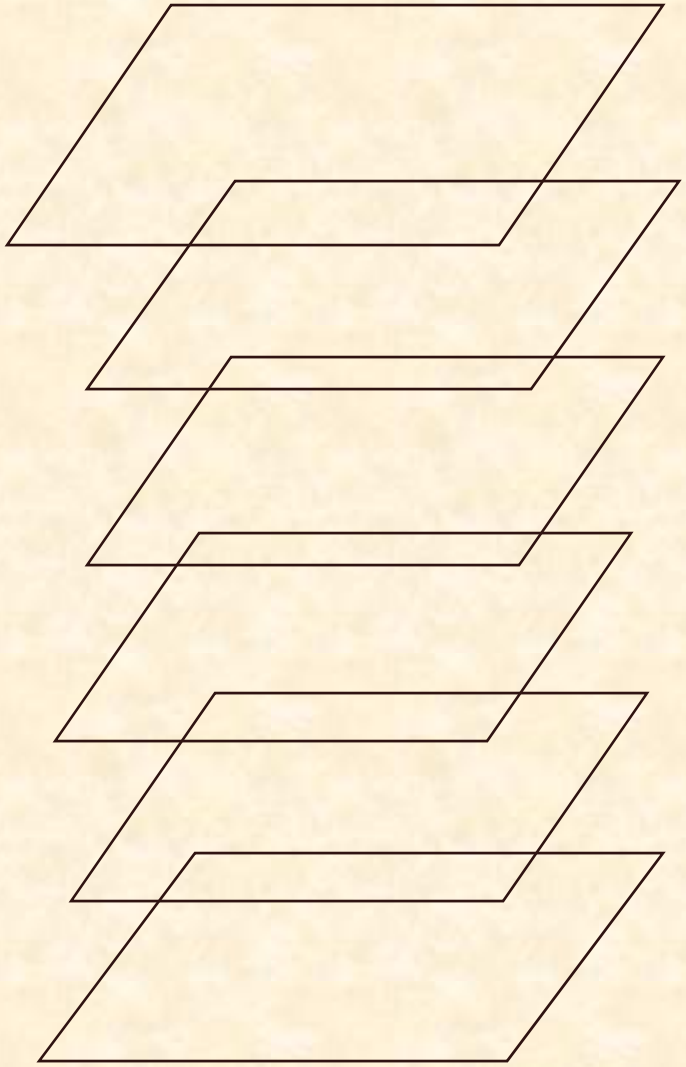
We are not naïve to ask the government for everything. But we are awake enough to see sewer and water facilities 'pass our heads, and under our feet', to factories in the neighboring Export Processing Zone (EPZ). Wherever these decisions are made, whoever makes them, is the very enemy to our development

Resident of City Carton

The power of the narrative!

"Supposing we all build those nice houses, what does it matter to have a good house if you have no water, no sewer, no public toilets, no public transport, poor public health clinics, impassable roads"

What do PGIS data layers look like?



Community Local knowledge

Social/physical infrastructure

Residential/housing

Hydro

Transportation

Elevation

You live it, you know it!

Build trust!

Let them talk do the listening!

Observe!


SLOTA
WELFARE
ASSOCIATION
MEMBERS WA SLOTA
MNAJULISHWA YA KUW
TUNA MATANGA SAFARI
MBILI KWA TIMOTHY AM
SYOKA NA-MONICA MAC
HARIB
KUANZA KIKAO NI
HAPO KESHO 6/11/02: KUMA
LISA NI JUMAPILI 10/11/02
MNAOMBWA KUHUDHURIA
NA KUCHAGIA KWA UKA-
RIMU; KIKAO NI HAPO
CORNER MBAYA.

Interact!

Sometimes, guide!

A new set of problems, Old problems worsen

- Air quality
- Service delivery
- Increased crime
- Land conflicts
- Diseases


ANNEX HAIR
SALON

Findings and Conclusions

- Peri-urban areas - the new homes of Africa's urban pop
- Geospatial technologies have the potential to empower peri-urban governments to respond to new (and old) problems
- Applications in Africa taking place within conventional GIS practice – focusing on the visual and quantifiable aspects of the urban environment – experiential component excluded.
- Geospatial technologies a major step forward – but can be more accessible, place-based and locally sustainable – especially for peri-urban towns
  - Political and social realities dictate alternative approaches.
- Limitations can be mediated by using alternative approaches – PGIS

Why do we propose PGIS?

- Place-based; people-oriented; context-specific; field-work based; put into consideration political and social realities on the ground; Integrative; relatively inexpensive; inclusive; locally sustainable
- Place-based understanding of peri-urban landscape is achieved through:
  - integrating community local knowledge into a GIS as an information layer.
- Local knowledge and expert GIS data are found to be complementary

Closing remarks…

- Africa's peri-urbanization is introducing a new set of problems to a landscape which is:
  - Environmentally fragile
  - Socially and spatially complex
  - Financially weak
  - Little understood
  - Data-poor
- Problems will be more complex than yesteryear's
- Complex problems will require complex solutions
- Role of geospatial technologies will be central, but not final
- Local knowledge must be an information layer
- Local communities must be partners

Appreciation…

- US Department of State
- University of Cape Town